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(72) Inventor(s): Andrew C Owens		(58) Field of Search: UK CL (Edition X) E1S INT CL E04G Other: EPDOC, WPI	
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(54) Abstract Title: **Guardrail protection system for scaffolding towers**

(57) The invention comprises a platform deck 2 incorporating a guardrail assembly 12 and 14 with rotatable, linked, spring-return hooks (22 Fig 3), which are fitted into a scaffolding tower to provide a 'safe working place' on the scaffold, which can then be re-positioned further up the tower as construction progresses by raising each end of the deck in turn causing the hooks (22 Fig 3) to automatically disengage from the structure and pass any obstructing frame members and which then can then be lowered onto the correct rung position automatically. Although the deck is free to be raised at each end without restriction, the deck cannot be over-turned by sideways rotational forces applied to the handrails or deck since each linked set of four hooks always remain parallel to each other preventing lateral rotation of the deck assembly. Decks may incorporate trap-door access hatches to gain safe access through the deck on narrow tower structures. For transportation and storage, the handrails may be removed and the advance guardrail assembly folded compactly.

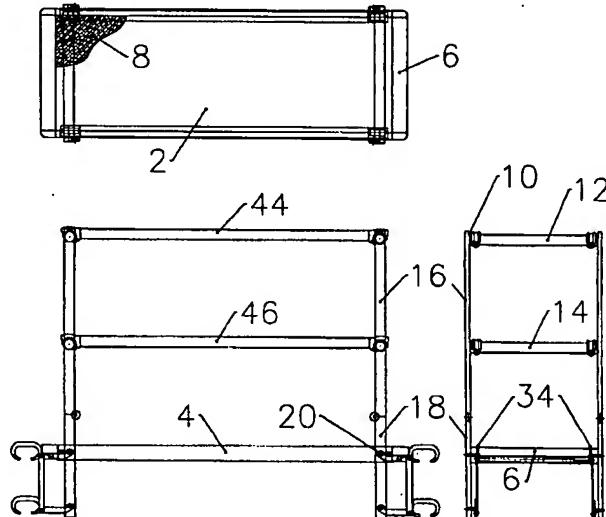


FIG. I

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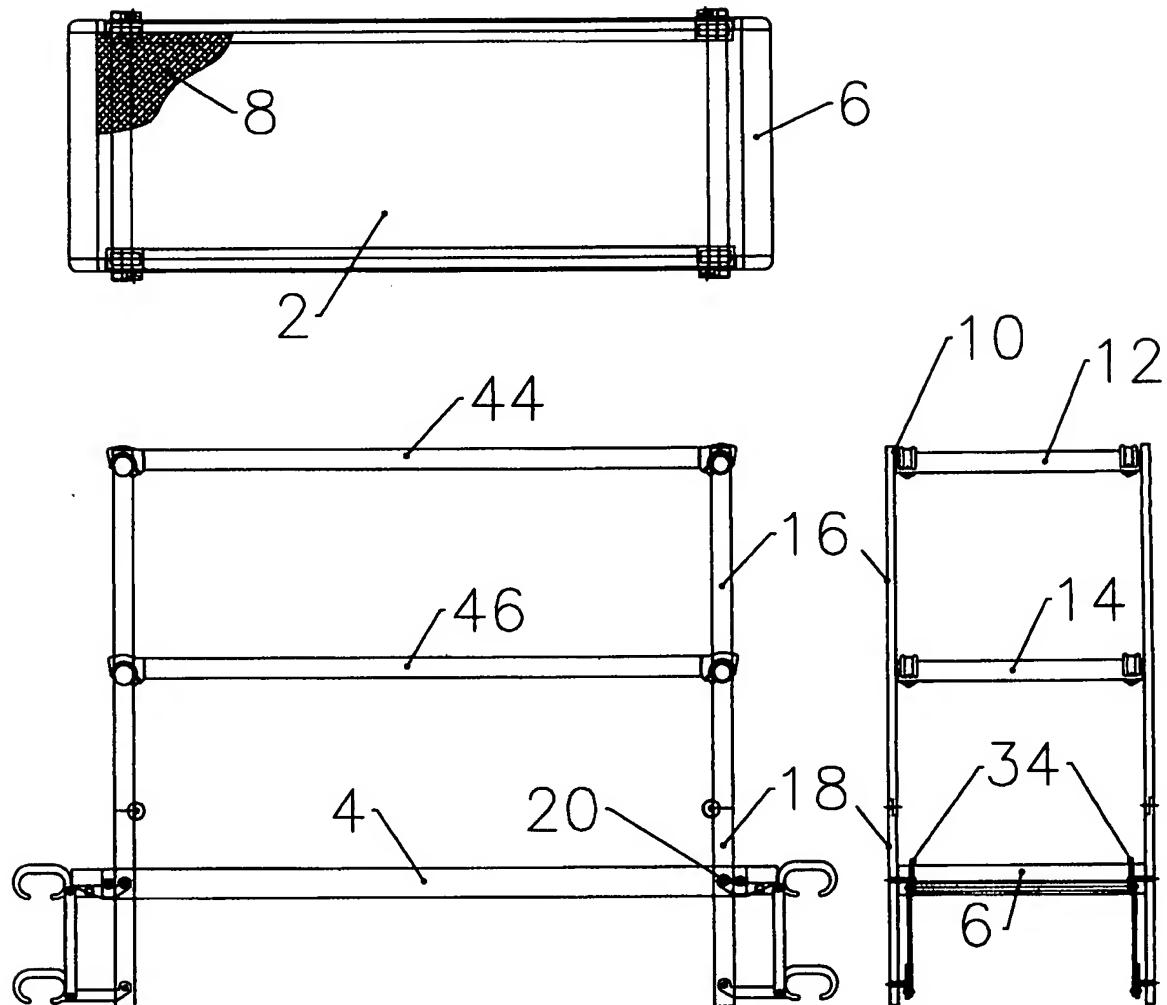


FIG.1

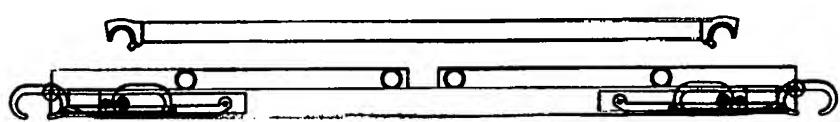


FIG.2

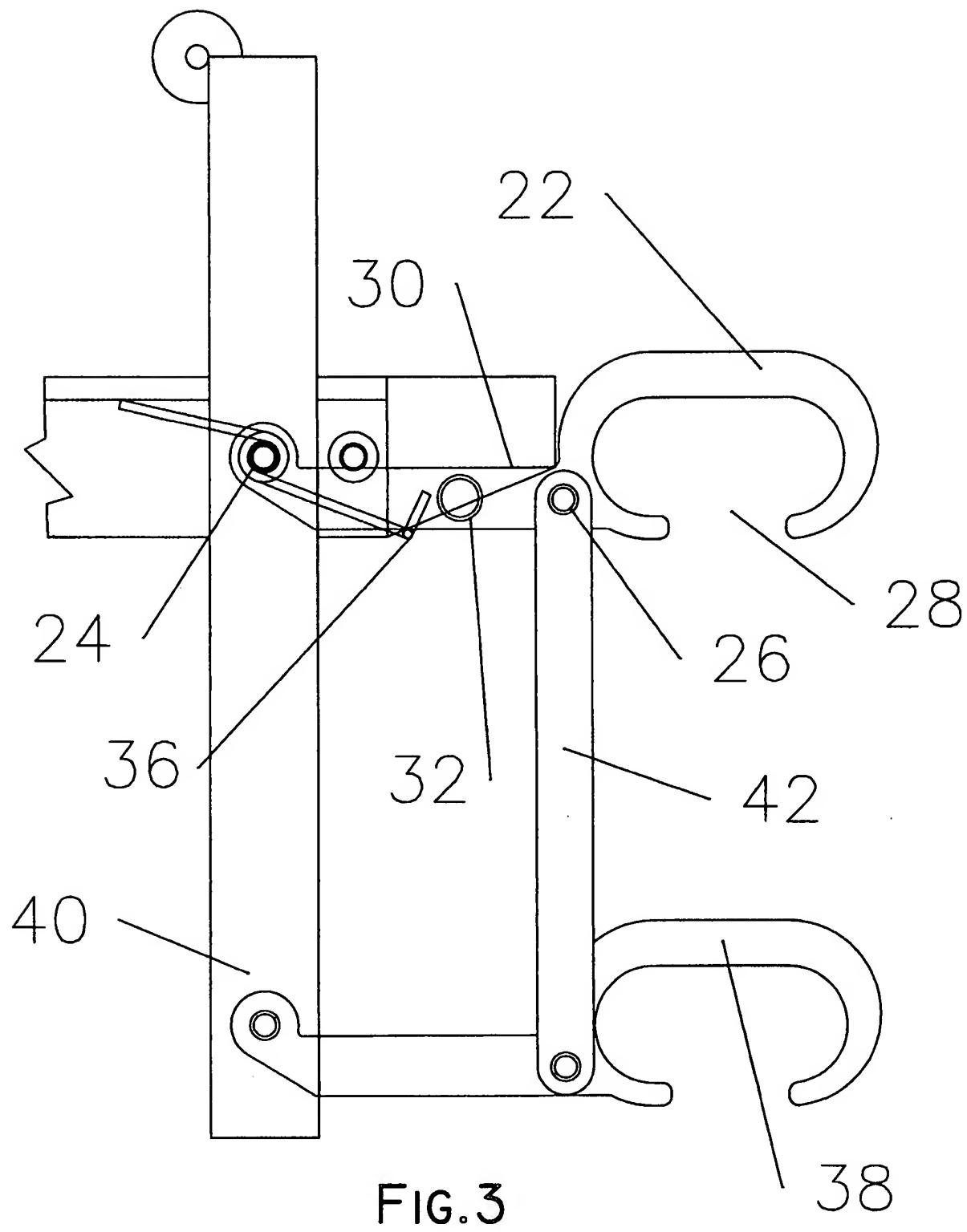
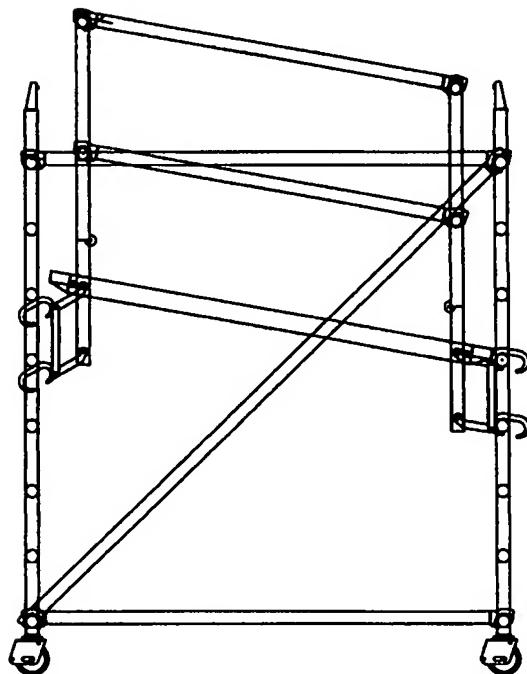
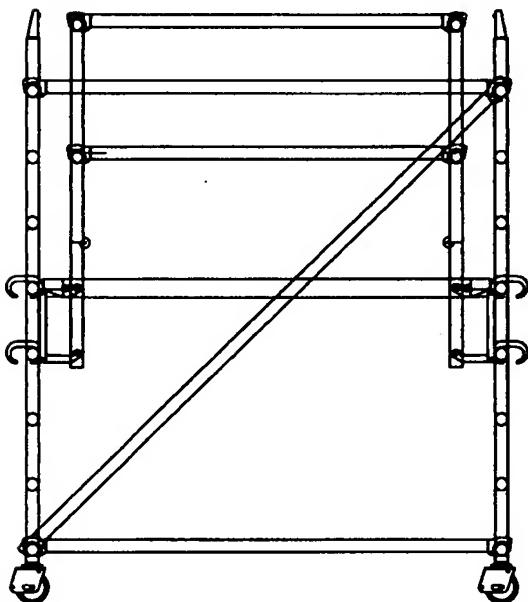
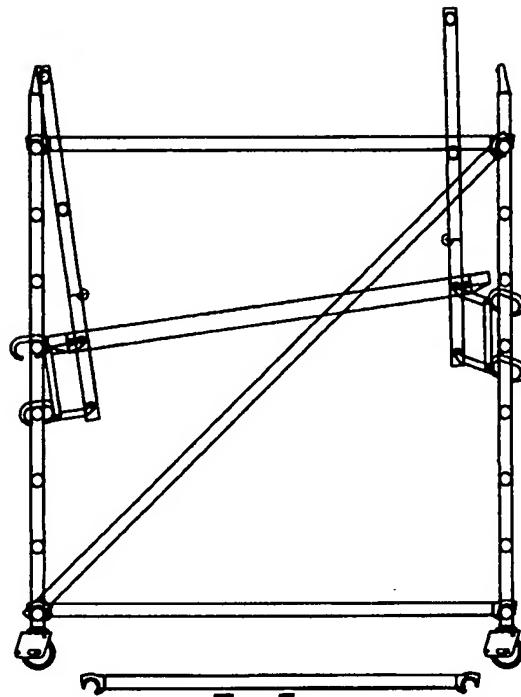
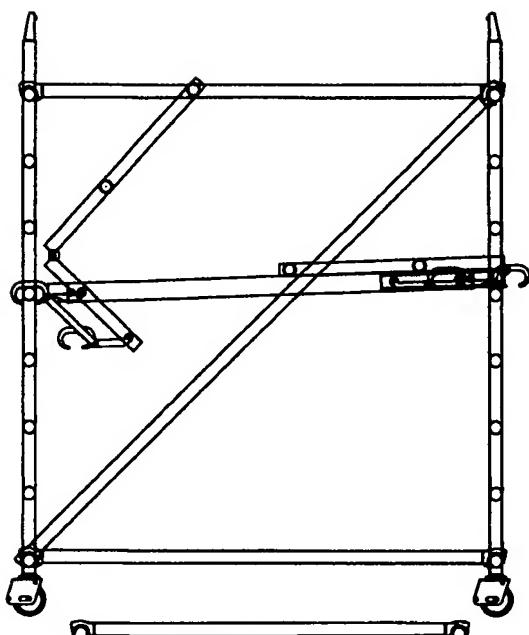


FIG. 3

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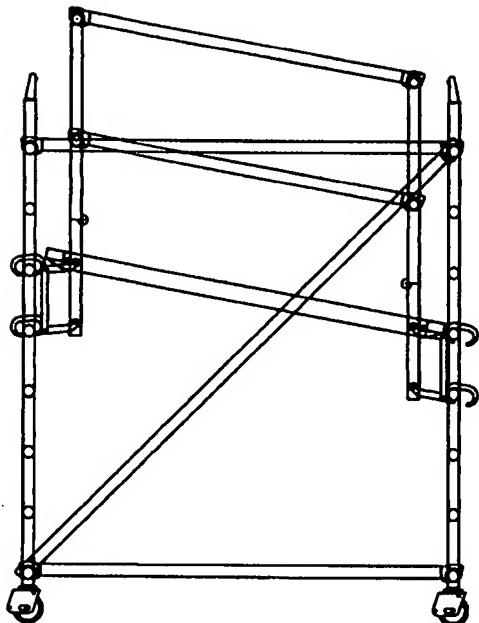


FIG.8

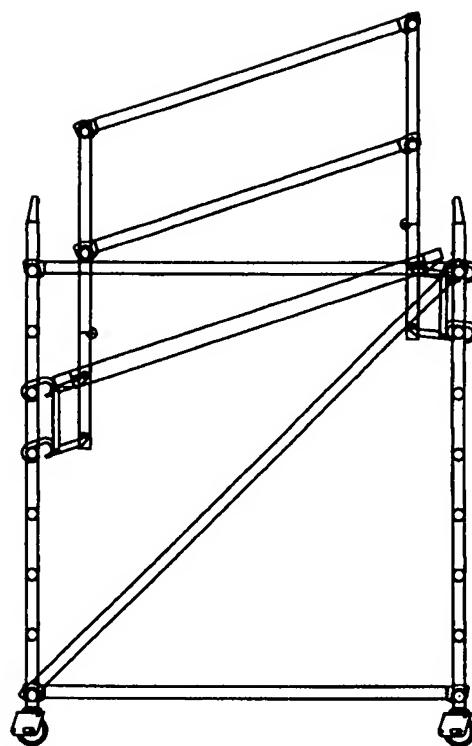


FIG.9

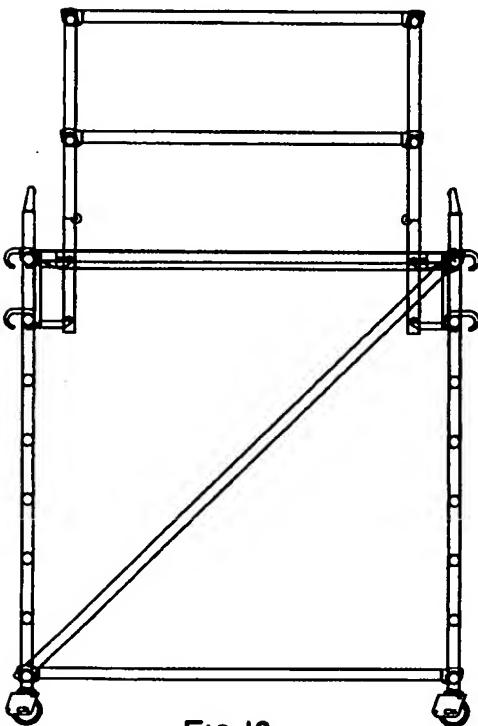


FIG.10

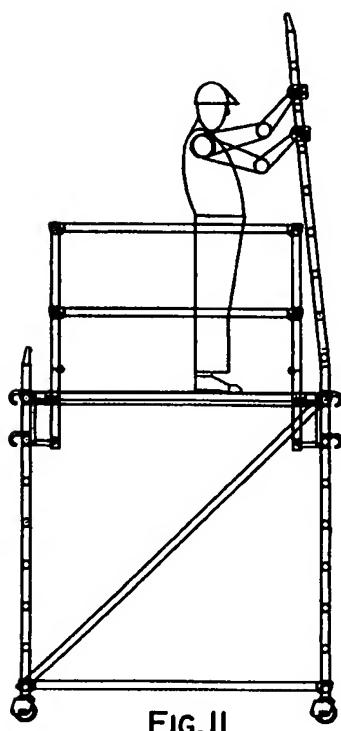


FIG.11

Guardrail protection system for Scaffolding Towers

Scaffolding has long been used in industry for gaining access to high and awkward locations. Whilst scaffolding provides a safe environment for operatives to work this is not always the case for the persons erecting the scaffolding structures. Systems exist for providing temporary safety rails in advance of the erection of the scaffolding but are primarily designed for the guarding of the outside face and ends of the scaffold and due to the complexity of the designs they are an expensive addition to the scaffolding project.

This invention relates to a system of safety rails whereby all four sides of a tower scaffold are simultaneously provided with guardrail protection.

The safety rails provided are independent from the scaffolding structure and are arranged such that the scaffolding can be erected and dismantled whilst within the perimeter of the safety rail system.

Once in place on the scaffold at ground level, the safety rail system may be progressively relocated to higher levels in the scaffolding tower from within the safety of the permanent guardrail system of the scaffold tower. During dismantling the safety rail system may be progressively relocated to lower levels within the tower scaffold to provide a safe working environment for the operatives.

When the scaffold tower is erected to the required height, it is not necessary to remove the advance guardrail system which may be left in place as a permanent safety system until such time as dismantling of the scaffolding is performed. A second safety system may be placed alongside the first system and the adjacent handrails relocated to provide a double width platform.

The invention will now be described with reference to the following drawings in which:-

Fig.1 shows a front elevation, side elevation and plan view of the guardrail system.

Fig.2 shows a front elevation of the guardrail system in the folded mode for handling and transportation.

Fig.3 shows an enlarged partial elevation of one end of the deck system.

Fig.4 to11 show elevations of the deck system in sequence as the erection proceeds.

The invention comprises of a platform member (2) incorporating a pair of side members (4) and a pair of end members (6) connected together to form a rigid framework onto which a flat surface member (8) is attached.

A pair of end guardrail frame members (10) incorporating upper and lower guardrails (12 & 14) and side members (16) incorporating pivotally connected lower side members (18). The lower side members are pivotally connected to the platform member by spindles (20) passing through both sets of components.

Hook members (22) incorporating pivot holes (24 & 26) an aperture (28) and an abutment portion (30) are connected together rigidly by spacer members (32), forming pairs of connected hooks (34). These pairs of hooks are pivotally connected at each end of the deck member using the spindles (20) such that each pair of hook members is free to rotate about the axis of the spindles. A spring device (36) is attached between the end of the deck member and the hook assembly such that the abutment portion of each of the hooks is held in contact with the underside of the end member (6). The springs are of sufficient strength as to counteract the force of gravity preventing the hook assembly from rotating about the spindle axes.

Two pairs of auxiliary hooks (38) are pivotally connected to the lower end of the lower side member (40) and to spacer bars (42) which are also pivotally connected to the upper hook assemblies such that the upper and lower pairs of hooks at each end of the deck remain parallel to one another at all times. A pair of upper handrails (44) are fitted to each side of the end guardrail at the topmost position and a second pair of handrails (46) are fitted to the intermediate handrail position.

For transportation and storage the handrails are removed and the advance guardrail assembly may be folded flat into a compact unit as shown in Fig. 2.

To erect the advance guardrail onto a scaffolding tower, the folded unit is placed on the scaffolding tower at a convenient height and one end guardrail assembly is unfolded and both pairs of hooks are located over a horizontal tower frame rung member as shown in Fig. 4. The other end of the deck is raised slightly and as the framework is unfolded, the gaps on the second two pairs of hooks are located over a horizontal frame rung member, Fig.5, such that the deck is located horizontally Fig.6.

Handrail members are installed to both sides of the end guardrails to form a continuous handrail around all four sides of the deck, Fig. 6.

To raise the advanced guardrail assembly within the tower, each end of the deck is raised in turn such that the hooks disengage from the horizontal member and are deflected downwards by the member above allowing the deck unit to pass through the tower. Once the hooks have passed the horizontal member they spring back into alignment with the deck and the deck may now be lowered onto the next available frame rung, Fig. 8.

Alternate ends of the deck are thus raised and repositioned, Fig.9, until the desired position is achieved, Fig.10. At all times the operation can be performed from a position of safety from within the tower structure. Although the deck is free to be raised at each end without restriction, the deck cannot be over-turned by sideways forces applied to the handrails since each linked

set of four hooks always remain parallel to each other preventing lateral rotation of the deck assembly.

Further tower components may be added to the tower structure from the safety of the guarded deck, (Fig.11), until the desired tower structure is complete. When necessary, additional tower platform units may be positioned below or beside the advance guardrail deck unit to provide an additional safe platform from which to operate the advance guardrail system at all times ensuring that temporary or permanent guardrails are positioned as required to provide a correctly guarded platform.

When narrow scaffolding towers are being erected, decks incorporating trap-door access hatches are used to gain safe access through the deck.

Claims.

What we claim is:-

Claim 1.

A platform deck incorporating an integral guardrail assembly linked to at least two pairs of rotatable, linked, spring-return hooks, at least one horizontal pair of which are rigidly linked together, which can be hooked over the horizontal rungs of a scaffolding tower to provide a safe working platform, which can then be re-positioned further up the tower as construction progresses by raising each end of the deck in turn causing the hooks to automatically disengage from the structure and bypass any obstructing frame members and which then can then be lowered onto a new rung position automatically and which, due to the rigidly linked pair of hooks, prevent the deck from being over-turned by sideways rotational forces applied to the handrails or deck due to each linked set of four hooks always remaining parallel to each other thus preventing rotation of the deck assembly..

Claim 2.

A platform deck as described in claim 1 incorporating a trap-door access hatch to gain safe access through the deck to the level above.

Claim 3.

A platform deck as described in claim 1 whereby the guardrail assembly may be folded compactly for transportation and storage.

Claim 4.

A platform deck as described in claim 1 whereby the rotatable hooks may be moved manually against the action of the return springs to enable the deck unit to be progressively lowered through the framework of a tower whilst dismantling the tower structure.



For Innovation

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Application No: GB0508511.3

Examiner: Mr Haydn Gupwell

Claims searched: 1-4

Date of search: 17 August 2006

Patents Act 1977: Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
A	None	FR2859745 A1 (COMABI)
A	None	EP0874108 A1 (SGB COMABI)
A	None	DE29808393 U1 (THYSSEN HUENNEBECK GMBH)

Categories:

X Document indicating lack of novelty or inventive step	A Document indicating technological background and/or state of the art.
Y Document indicating lack of inventive step if combined with one or more other documents of same category	P Document published on or after the declared priority date but before the filing date of this invention.
& Member of the same patent family	E Patent document published on or after, but with priority date earlier than, the filing date of this application

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E04G

The following online and other databases have been used in the preparation of this search report

EPODOC, WPI